

We claim:

~~Sup. 11~~ 1. A method for determining packet processing data, comprising the steps of:

receiving a packet;

5 forming a plurality of subtuples for the packet from flow properties associated with the packet;

applying one or more of the subtuples as respective inputs to respective one or more of lookups;

and

10 returning packet processing data as an output from at least one of the lookups.

2. The method according to claim 1, further comprising the steps of:

15 returning a nickname as an output from at least one of the lookups; and

applying the nickname as an input to at least one of the lookups.

20 3. The method according to claim 2, wherein the nickname has a lower bit count than at least one of the subtuples.

4. The method according to claim 1, wherein fewer  
25 than all of the plurality of subtuples are applied as the respective inputs to the respective ones of lookups.

~~5.~~ 5. A method for determining packet processing data, comprising the steps of:

30 receiving a packet;

forming a tuple for the packet including a plurality of flow properties associated with the packet; and applying one or more of portions of the tuple

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to respective consecutive one or more of lookups until packet processing data are returned.

6. The method according to claim 5, further comprising the step of:

returning an indicator with the packet processing data to indicate the return of the packet processing data.

7. The method according to claim 6, wherein the indicator is returned prior to applying all portions of the tuple to the lookups.

8. A method for determining packet processing data, comprising the steps of:

inputting a first lookup key including a first portion of a tuple;

determining a nickname in response to the first lookup key, the nickname having a lower bit count than the first lookup key;

outputting the nickname;

inputting a second lookup key including a second portion of the tuple and the nickname; and

outputting packet processing data in response to the second lookup key.

9. The method according to claim 8, wherein the ones of outputting steps further include outputting respective ones of recursion indicators sufficient to indicate the need for inputting an additional lookup key.

10. The method according to claim 8, wherein the ones

of outputting steps further include outputting ones of indicators, respectively, sufficient to indicate the absence and presence, respectively, of packet processing data.

5 11. The method according to claim 8, wherein the ones Of outputting steps further include outputting ones of indicators, respectively, sufficient to indicate the presence and absence, respectively, of a nickname.

10 12. A method for determining packet processing data, comprising the steps of:  
receiving a packet;  
forming a tuple for the packet including a first  
subtuple identifying a first flow property associated with  
15 the packet and a second subtuple identifying a second flow property associated with the packet;  
applying the first subtuple to a database element;  
and  
returning data from the database element in  
20 response to the first subtuple to preempt application of the second subtuple to the database element.

25 13. The method according to claim 12, wherein the returned data includes packet processing data.

30 14 A switching interface for a data communication switch, comprising:  
an access controller having a port for receiving a packet; and  
a switching engine coupled to the access  
controller for receiving the packet from the access  
controller, for determining a tuple for the packet including  
a plurality of flow properties, for transmitting ones of

portions of the tuple to a database element, and for receiving packet processing data from the database element in response to one of the portions.

5        15. The switching interface according to claim 14, wherein the flow properties include a destination address.

16. The switching interface according to claim 15, wherein the flow properties include a source address, a  
10 port, and a quality of service.

17. The switching interface according to claim 14, Wherein the received packet processing data include a plurality of packet flow information.

15        18. A switching interface for a data communication switch, comprising:  
             means for receiving a packet;  
             means for forming a plurality of subtuples for the  
20 packet from flow properties associated with the packet;  
             means for applying one or more of the subtuples as respective inputs to respective one or more of lookups; and  
             means for returning packet processing data as an  
25 output from at least one of the lookups.

19. The switching interface according to claim 18, Further comprising:  
             means for returning a nickname as an output from  
30 at least one of the lookups; and  
             means for applying the nickname as an input to at least one of the lookups.

20. The switching interface according to claim 19, wherein the nickname has a lower bit count than at least one of the subtuples.

5 21. The switching interface according to claim 18, wherein fewer than all of the plurality of subtuples are applied as the respective inputs to the respective ones of lookups.

10 22. A switching interface for a data communication switch, comprising:

means for receiving a packet;

means for forming a tuple for the packet including a plurality of flow properties associated with the packet; and

15 means for applying one or more of portions of the tuple in respective consecutive one or more of lookups until packet processing data are returned.

20 23. The switching interface according to claim 22, further comprising:

means for returning an indicator with the packet processing data to indicate the return of the packet processing data.

25 24. The switch according to claim 23, wherein the indicator is returned prior to applying all portions of the tuple to the lookups.

30 25. A switching interface for a data communication switch, comprising:

means for inputting a first lookup key including a first portion of a tuple;

means for determining a nickname in response to the first lookup key, the nickname having a lower bit count than the first lookup key;

means for outputting the nickname;

5 means for inputting a second lookup key including a second portion of the tuple and the nickname; and

means for outputting packet processing data in response to the second lookup key.

10 26. The switching interface according to claim 25, further comprising means for outputting respective ones of recursion indicators sufficient to indicate a need for inputting an additional lookup key.

15 27. The switching interface according to claim 25, further comprising means for outputting ones of indicators, respectively, sufficient to indicate the absence and presence, respectively, of packet processing data.

20 28. The switching interface according to claim 25, further comprising means for outputting ones of indicators, respectively, sufficient to indicate the presence and absence, respectively, of a nickname.

25 ~~29~~. A switching interface for a data communication switch, comprising:

means for receiving a packet;

30 means for forming a tuple for the packet including a first subtuple identifying a first flow property associated with the packet and a second subtuple identifying a second flow property associated with the packet;

means for applying the first subtuple to a database element; and

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means for returning data from the database element in response to the first subtuple to preempt application of the second subtuple to the database element.

- 5      30. The switching interface according to claim 29, wherein the returned data further includes packet processing data.

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